

REPORT

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[Comment: This report presents abstracts taken from issues of the Soviet periodical Referativnyy Zhurnal published April-July 1954. These abstracts are of articles originally published in Soviet scientific and technical serial publications which are not known to be available outside the Soviet Orbit.

The following form is used for each abstract in this report:

General subject, specific subject (Soviet abstract number)
Name of unavailable periodical, volume and/or issue number,
 date, pages
 Author of article
 Title of article (Language, if other than Russian)
 Abridgment of abstract (Source)

The sources, indicated in parentheses at the end of each abstract, are abbreviated as follows:

RZhAstr	Moscow, Referativnyy, Zhurnal	-- Astronomiya i Geodeziya
RZhFiz	Moscow, Referativnyy, Zhurnal	-- Fizika
RZhKhim	Moscow, Referativnyy, Zhurnal	-- Khimiya
RZhMat	Moscow, Referativnyy, Zhurnal	-- Matematika
RZhMekh	Moscow, Referativnyy, Zhurnal	-- Mekhanika

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CLASSIFICATION S-E-C-R-E-T

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I. ASTRONOMY

Astrometry, Yearbooks (4163)Byull. Inst. Teoreticheskoy Astronomii AN SSSR [Vol] 5, No 8, 1953, pp 461-465

Anonymous

Summary of Reports of the Conference on the "Astronomical Yearbook of USSR"

The conference was held December 1952, with 26 astronomical observatories and universities taking part. Amendments and supplements in the new edition of the yearbook pertaining to the ephemeris of the sun, planets, and the moon were considered. Some suggestions made at the Eighth Meeting of the International Astronomical Society in Rome in 1952 were accepted. (RZhAstr, No 7, 1954)

Geodesy, Computational Techniques (4359)Sbornik Statey po Geodezii, No 5, 1953, pp 81-82

Angelov, S. A.

Mechanical Method for Computation of Angular Magnitudes From Combinations

Suggests a method of mastering computation by equalizing angles at the stations, at which they have been measured in all combinations. It also facilitates the computations. (RZhAstr, No 7, 1954)

Geodesy, Computational Techniques (4360)Byull. Inst. Teoreticheskoy Astronomii AN SSSR, Vol 5, No 8, 1953, pp 512-545

Kulikov, D. K.

Mechanization of Astronomical Computations

States that all computational work of the Academy of Sciences USSR is performed on electronic computers. Briefly describes the types of computers: perforator, tabulator, filing machine, reproducer, and multiplier. Gives two examples of astronomical computations on computers. (RZhAstr, No 7, 1954)

Solar System, Eclipse of the Moon (4272)Byull. Stalinabaskoy Astron. Observatorii, No 7, 1953, pp 26-28

Bakharev, A. M., and Yerleksova, G. Ye.

Observations of the Full Lunar Eclipse, 29-30 January 1953

The authors compile a table of variation of illumination by the moon depending on the phase of eclipse, by using measurements by G. Ye. Yerleksova and N. N. Suslova made with a wedge photometer during clearance of clouds. (RZhAstr, No 7, 1954)

Stellar Astronomy, Stellar Magnitudes (4210)Izv. Glavnoy Astron. Observ. AN Ukrainskoy SSR, No 1, 1953, pp 3-66

Tsesevich, V. P.

Tentative Establishment of a Big Photometric Standard in the Constellation Aquarius

It is planned to process six regions in the constellations Cepheus, Orion, Hydra, Ophiuchus, and Aquarius for the establishment of a big photometric standard. Thereafter, intermediary magnitudes will be set up. (RZhAstr, No 7, 1954)

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II. CHEMISTRY

Analytical Chemistry, Inorganic (16804)
Nauchn. Zap. Dnepropetrovskogo Gos. Un-ta, Vol 43, 1953, pp 105-115
 Vasilenko, V. D.; Reznik, B. Ye.; Lutsenko, Ye. Ye.
 Microcrystalline Determination of Some Rare Elements

Quinoline, O-Oxyquinoline, and dibromooxyquinoline form complex compounds with In, Tl, Sb, Sn, V, W, Mo, and Tl. (RZhKhim, No 4, 1954)

Analytical Chemistry, Inorganic (16829)
Nauch. Zap. Dnepropetrovskogo Gos. Un-ta, Vol 43, 1953, pp 31-35
 Berzovskaya, F. I.; Solomko, Z. F.
 Determination of Carbon Disulfide in Industrial and Crude Benzene

CS₂ was determined colorimetrically by making use of Selivanov's reaction. The CS₂ is converted to ethyl xanthogenate in caustic alcohol, which then forms a red-violet complex with Mo. (RZhKhim, No 4, 1954)

Analytical Chemistry, Inorganic (16839)
Nauch. Zap. Dnepropetrovskogo Gos. Un-ta, Vol 43, 1953, pp 23-29
 Fel'dman, M. M.
 Phototurbidimetric Determination of Weighed Matter in Water

Points out possibility of using the phototurbidimetric method for determining the amount of weighed matter in artificially clouded systems and in natural waters. The determination can be made in 8-10 minutes, as compared to 4 hours using the conventional method of weighing. The relative error does not exceed 25 percent. Suggests using the method for technical analyses. (RZhKhim, No 4, 1954)

Biological Chemistry, Biochemistry of Plants (16548)
Izv. Moldavskogo Fil. AN SSSR, No 2, 1953, pp 75-78
 Dorokhov, L. M.; Klimenko, V. G.; Korokhov, B. L.
 Effect of Conditions of Mineral Nutrition on Some Physiological Indexes and on Nitrogen-Bearing Substances in Winter Wheat Grain

Conducted experiments on the growth of various types of winter wheat by using various fertilizers containing phosphorus and potassium salts. The conditions of mineral nutrition have an effect on the form in which nitrogen exists in the grain. (RZhKhim, No 4, 1954)

III. MATHEMATICS

Differential Equations, Applications to Physics (3717)
Dokl. AN Uz. SSR, No 10, 1953, pp 3-5
 Arzhanykh, I. S.
 Representation of a Dynamic Displacement Vector by Dependent Wave Functions

Four theorems are formulated which concern the use of wave equations to represent the solution of a system of equations from the theory of elasticity. Although these theorems are not proved in the article, the author gives indications as to how the proofs may be worked out. (RZhMat, No 6, 1954)

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Integral Equations (3735)
Dokl. AN Uzb. SSR, No 8, 1953, pp 3-6
 Bykov, Ya. V.

Theory of Linear Integrodifferential Equations

The author studies a particular type of system of integrodifferential equations. He devotes considerable space to the "fundamental system," by which is meant the system of particular solutions whose Wronskian is not identically equal to zero. The article also includes a discussion of the Cauchy problem for the system being investigated. (RZhMat, No 6, 1954)

Probability Theory (3763)
Voyennyy vestnik, No 1, 1953, pp 49-54
 Kozhin, G.

Study of Probability Theory

[No abstract given.] (RZhMat, No 6, 1954)

Theory of Functions of a Real Variable, Approximation of Functions (3664)
Soobshch. AN Gruz. SSR, Vol 14, No 7, 1953, pp 385-392
 Timan, M. F.

(C, Alpha, Beta)-Summability of Fourier Series of Functions of Two Variables

Proves three theorems relating to the summability of double Fourier series. Offers a proof of a theorem previously published without proof in Dokl. AN SSSR, Vol 76, No 5, 1951, pp 647-649, which is in effect a generalization of an earlier theorem originally published in 1939 by Andersen, also concerned with double Fourier series. (RZhMat, No 6, 1954)

IV. MECHANICS

Elasticity and Plasticity, Mechanical Properties and Testing of Materials (3891)
Doklady Akademii Nauk Arm SSR, Vol 16, No 5, 1953, pp 141-147
 Atsagortsyan, Z. A.

Correlation Connection of the Strength of Porous Material With the Degree and Character of Its Porosity

By methods of mathematical statistics there are given the results of tests of 24 cube-shaped blocks made from lithoid pumice with a 10-cm side. Article demonstrates that there is a linear correlation between the strength of lithoid pumice, porosity and water absorption. (RZhMekh, No 6, 1954)

General Mechanics, Fundamentals of Mechanics (3586)
Doklady Akademii Nauk Uzbek SSR, No 11, 1953, pp 14-18
 Boldinskiy, G. I., and Zel'tin, A. I.

On the Motion of a Body Under the Action of Continuous Impacts

The author derives differential equations for the motion of a body under the action of impacts and also the laws of quantities of motion and the moments of quantities of motion. (RZhMekh, No 6, 1954)

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History of Mechanics, Biography (3565)
Metsniyereba da Tekhnika, No 8, 1953, pp 45-46
 Anonymous
 Krylov, A. N.

Gives basic biographic data and a short outline of the scientific and engineering activity of A. N. Krylov, on the occasion of his 90th birthday. (RZhMekh, No 6, 1954)

History of Mechanics, Biography (3574)
Metsniyereba da Tekhnika, No 7, 1953, pp 37-39
 Ianvarashvili
 Founder of the Hydrodynamic Theory of Lubrication -- N. P. Petrov
 [No abstract given.] (RZhMekh, No 6, 1954)

History of Mechanics, Biography (3575)
Metsniyereba da Tekhnika, No 8, 1953, pp 46-47
 Gomelauri
 Vladimir Grigor'yevich Shukhov

Gives a short account of the services of V. G. Shukhov as scientist and engineer, on the occasion of his 100th birthday. (RZhMekh, No 6, 1954)

V. PHYSICS

Atomic Physics, Cosmic Rays
Byull. Polskoy Akad. Nauk, Otd. III, [Vol] 1, No 1-2, 1953, pp 40-42
 Pnevskiy, Yu.
 Retarded Decay of a Heavy Fragment Ejected From a Nuclear Star
 (Cf. RZhFiz, 1954, Abstract No 1356.) [No abstract given.] (RZhFiz, No 6, 1954)

Atomic Physics, Structure and Properties of Atomic Nuclei (5859)
Byull. Polskoy Akad. Nauk, Otd. III, [Vol] 1, No 1-2, 1953, pp 26-32
 Krulikovkiy, V.
 Angular Correlations During Simultaneous Two-Quanta Processes

Discusses case of angular correlation of two gamma-quanta participating in a simultaneous process of second order, e.g. in a two-quanta emission, absorption, or combination scattering. (RZhFiz, No 6, 1954)

Atomic Physics, Structure and Properties of Atomic Nuclei (5858)
Byull. Polskoy Akad. Nauk, Otd. III, [Vol] 1, No 1-2, 1953, pp 14-17
 Dombrovskiy, Ya.
 Angular Correlation in a Three-Step Cascade Gamma-Emission

By analyzing the cascade nuclear conversion with consecutive emission of three gamma quanta, author proves by the method of perturbation theory a formula for angular correlation between the directions of the three gamma quanta. (RZhFiz, No 6, 1954)

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Atmospheric Physics, Night Sky Glow (6785)
Izv. Krymskoy Astrofiz. Observ., No 10, 1953, pp 54-73
 Chuvayev, K. K.

Electrophotometric Investigation of Night Sky Glow in Several Spectral Regions

Describes apparatus used and results of observations which permitted detection of the intensity of oxygen emission OI (λ 5577). Assumes that upper atmospheric layers are the emission source of continuous spectrum. Concludes that there exist two independent mechanisms exciting the glow. (RZhFiz, No 6, 1954)

Atmospheric Physics, Scattering of Light (5546)
Byull. Vses. Astronomo-Geodez. Ob., No 14, 1953, pp 3-15
 Bronshte, V. A.

Observation of the Brightness of the Sky During the Total Solar Eclipse of 19 June 1936

Observations made by the society in Sagarchino (near Ak-Bulak) with six photometers of various construction were calibrated and plotted. The results agreed with the theoretical predictions by V. G. Fesenkov (cf. DAN, Vol 2, No 6, 1936 and Astron. Zh., Vol 29, No 6, 1952). (RZhFiz, No 5, 1954)

Optics, Luminescence (6595)
Byull. Polskoy Akad. Nauk, Otd. III, [Vol] 1, No 1-2, 1953, pp 53-56
 Rosinskiy, K.

Temperature Extinction of Fluorescence of Biacene Solution

The thermal dependence of fluorescent intensity in the temperature range of 20-200°C of biacene solution in silicone was studied with the purpose of clarifying the behavior of thermal extinction of fluorescence of biacene solution (RZhFiz, No 6, 1954)

Optics, Physiological Optics (6674)
Probl. Fiziol. Optiki, [No] 8, 1953, pp 325-329
 Veynberg, V. B., Nikolskaya, N. A.
 Tables for Measuring Visual Acuity

Attempts to improve patterns of the Landolt ring and compile new tables. (RZhFiz, No 6, 1954)

Optics, Scientific Photography (6704)
Izv. Glavnoy Astron. Observ. v Pulkove, Vol 19, No 151, 1953, pp 97-129
 Mikhelson, N. N.

Effect of Dislocation of Negative on Accuracy of Photometric Measurements

Presents computation of variation of a light beam, incident on the photoelement with assumptions of simplifications: the optical system is aberration- and diffraction-proof, without scattering and absorption. Applies results to boundary cases. (RZhFiz, No 6, 1954)

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Optics, Scientific Photography (6705)
Izv. Glavnoy Astron. Observ. v Pulkove, Vol 19, No 151, 1953, pp 69-96
 Mikhelson, N. N.
 Self-Recording Compensating Isophotometer

Presents description of the optic, electric, and mechanical systems of the apparatus. Gives results of measurements of several nebula pictures. (RZhFiz, No 6, 1954)

Optics, Scientific Photography (6703)
Izv. Glav. Astron. Observ. v Pulkove, Vol 19, No 151, 1953, pp 49-68
 Krat, T. V.
 Photometry of Astronomical Negatives in the Case of High Densities of Pictures

Discusses two methods facilitating photomeasuring of overexposed unique astronomical pictures, i. e. contact print of negative or chemical reduction of negative. Finds chemical reduction of negative advantageous. (RZhFiz, No 6, 1954)

Optics, Spectroscopy (5417)
Zapiski Leningradskogo Gornogo Inst., Vol 29, No 2, 1953, pp 157-172
 Kler, M. M., and Khokhlov, V. V.
 Application of Full Spectral Analysis in Geological Expeditions

Describes with more detail than previously (cf. Kler, M. M., "Inform. tekhn. listok Leningradskogo doma nauch. tekhn. propagandy," 1952, No 72, [page] 413) a spectrographical method for easy detection of a great number of elements in ores. (RZhFiz, No 5, 1954)

Physics of the Atmosphere, Night Sky Glow (5561)
Byull. Stalinabadskoy Astron. Observatorii, No 6, 1953, pp 17-20
 Bakharev, A. M.
 Problem of the Latitude of Counter glow and of the Illuminated Band

Author processed results observed by G. P. Zakharov in 1913-1939 in Ashkhabad, Tashkent, and China. (RZhFiz, No 5, 1954)

Solid State Physics, Mechanical Properties and Deformation of Metals (6195)
Voprosy Fiz. Metallov i Metallovedeniya, No 4, 1953, pp 22-29
 Lysak, L. I., and Nesterenko, Ye. G.
 Fine Crystalline Structure of a Welded Seam

Stresses of 2-d and 3-d kind were tested on specimens 0.7-0.8 mm in diameter, cut from various parts of the seam and etched to 0.4-0.5 mm. Results are presented in diagrams. (RZhFiz, No 6, 1954)

Solid State Physics, Thermodynamics (4896)
Izv. Sektora Fiz.-Khim. Analiza (Inst. Obshch. i Neorgan. Khimii A. N. SSSR), No 22, 1953, pp 122-128
 Grigor'yev, A. T., and Gruzdeva, N. M.
 Effect of Tungsten on the Structure of Diagram of State of the Ternary System Iron-Chromium-Manganese

An isothermal cross section at room temperature is made of the diagram Fe-Cr-Mn + 2% W within limits of 6-16% Mn and 30% Cr. It was found by metallographic investigation that the presence of W shifts the exterior limit of gamma-loop to higher concentrations of Cr, which leads to a formation of a three-phase region. (RZhFiz, No 5, 1954)

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Solid State Physics, Thermodynamics (4900)
Vopr. Fiz. Metallov i Metallovedeniya A. N. Ukrainskoy SSR, No 1, 1953, pp 49-54
 Dektyar, I. Ya., and Kumok, L. M.
 On the Mechanism of Alloy Oxidation

By reading weight increments of specimens, oxidized in air in an electric furnace at a temperature of 750-860°C, kinetics of the growing oxide layer, thermal dependence of the oxidation constant, and the diffusion of Mn in the alloy Ni-Mn were studied. (RZhFiz, No 5, 1954)

Solid State Physics, Thermodynamics (4906)
Vopr. Fiz. Metallov i Metallovedeniya A. N. Ukrainskoy SSR, No 4, 1953, pp 95-103
 Krivogla, M. A., and Smirnov, A. A.
 Diffusion of Embedded Atoms in Ordering Alloys With Crystalline Lattice of Fe₃Al Type

Based on the magnitude of potential energy of diffusing interstitial atoms of lattice (U_0) and on the probability of realization around these atoms of a m-order configuration (W_c^m), the authors obtained the number of atoms forming the configuration m around interstices of two kinds, O_1 and O_2 , (n_{1m} and n_{2m}): $n_{1m} = \lambda W_{O_1}^m \exp \frac{U_0^m}{kT}$, $n_{2m} = \lambda W_{O_2}^m \exp \frac{U_0^m}{kT}$, where λ is a normalizing coefficient. (RZhFiz, No 5, 1954)

Solid State Physics, Thermodynamics (4898)
Izv. Sektora Fiz.-Khim. Analiza (Inst. Obshch. i Neorgan. Khimii A. N. SSSR), No 22, 1953, pp 117-121
 Kornilov, I. I., and Nikolayenko, G. N.
 Phase Diagram of the System Nickel-Chromium-Manganese

Microstructural method using 12 cross sections was used to investigate phase diagram at room temperature of Ni-Cr-Mn. Solubility of Cr in Ni was found 35%, Mn in Ni about 36%, and maximum of joint Cr and Mn solubility was 24% Cr + 24% Mn. (RZhFiz, No 5, 1954)

Theoretical Physics, Quantum Electrodynamics (5692)
Byull. Polskoy Akad. Nauk, Otd. III, [Vol] 1, No 1-2, 1953, pp 33-36
 Plebanskiy, Ya.
 Nonlinear Electrodynamics and Elementary Laws

Discusses the choice of a Lagrange function in nonlinear electrodynamics of Born-Infeld. Author establishes on basis of variational principle a single-valued relation of the Lagrangian with the function $p(r) = \varphi'(r)$. (RZhFiz, No 6, 1954)

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